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## ***Scirtothrips* genus-group in Iran with an unusual new species of *Scirtothrips* (Thysanoptera: Thripidae)**

KAMBIZ MINAEI<sup>1,3</sup> & LAURENCE MOUND<sup>2</sup>

<sup>1</sup> Department of Plant Protection, College of Agriculture, Shiraz University, Shiraz, Iran.

<sup>2</sup> CSIRO Australian national Insect Collection, Canberra, ACT, Australia. Email: laurence.mound@csiro.au

<sup>3</sup> Corresponding author. E-mail: kminaei@shirazu.ac.ir

### **Abstract**

A new species of *Scirtothrips* Shull from leaves of *Tamarix* sp. is described and illustrated from southern Iran. Among *Scirtothrips* species, it is unusual in having two pairs of long pronotal posteroangular setae, and ocellar setae III unusually long. A key is provided to distinguish members of the *Scirtothrips* genus-group in Iran: *Drepanothrips reuteri* Uzel, *Scirtothrips dorsalis* Hood, *S. hafezi* sp. n. and *S. mangiferae* Priesner.

**Key words:** Fars province, new species, *Tamarix* sp., thrips

### **Introduction**

Masumoto and Okajima (2007) recognized *Scirtothrips* genus-group with 10 genera, but to these Ng and Mound (2015) added *Ajothrips* Bhatti and *Kenyattathrips* Mound and simultaneously placed *Sericopsothrips* Hood as a synonym of *Scirtothrips* Shull. Thus 11 genera worldwide are currently recognised in this group and an identification key to these is available (Ng & Mound 2015). Members of this group breed on a wide range of plants, and they appear to feed and oviposit on tissues of the young leaves and fruitlets. Some species are of considerable economic importance as major crop pests around the world (Talekar 1991; Rugman-Jones *et al.* 2006, 2007) as well as Iran (Minaei *et al.* 2016).

Up to now in Iran, only two genera of *Scirtothrips* genus-group have been recorded, including the three species *Drepanothrips reuteri*, *Scirtothrips dorsalis*, and *S. mangiferae* (Minaei 2013; Minaei *et al.* 2016). In this paper a new *Scirtothrips* species is described, and an illustrated key provided to the members of this group in Iran together with information about each species from this country.

Full nomenclatural information about Thysanoptera is available on the website ThripsWiki (2018).

### **Materials and methods**

Thrips specimens discussed in this paper were macerated in 3% NaOH solution for 4–5 hours and washed in distilled water before dehydration in a series of alcohol (60%–100%). The specimens were mounted onto slides in Canada balsam. The observations on structure were made using an Olympus BX51 phase-contrast microscope, and photomicrographs and measurements were made using this microscope with DP27 digital camera and cellSens software. Figures 9, 10 and 12 were prepared with a Leica DM2500 microscope with Nomarski illumination, and processed through Automontage software Terminology used in this paper follows Mound and Palmer (1981) and Hoddle and Mound (2003).

The holotype and one male of the new species are deposited in the Natural History Museum, London. Two paratypes (one female and one male) are deposited in the Australian National Insect Collection, CSIRO, Canberra. Most of the other materials are deposited in the collection of the Department of Plant Protection, College of Agriculture, Shiraz University, Shiraz.

## Key to species of *Scirtothrips* genus-group from Iran

1. Antennae 6-segmented (Figs. 1, 3); in male abdominal tergite IX with drepanae (Fig. 2) ..... *Drepanothrips reuteri*
- Antennae 8-segmented (Fig. 11); in male abdominal tergite IX with or without drepanae ..... 2
2. Pronotum with two pairs of posteroangular setae that are at least 0.4 as long as pronotum median length (Fig. 9); ocellar setae III about 1.7 times as long as distance between posterior ocelli (Fig. 9) ..... *Scirtothrips hafezi* sp.n.
- Pronotum with posteroangular setae no more than 0.3 as long as pronotum median length (Fig. 4); ocellar setae III about 1.0 times as long as distance between posterior ocelli (Fig. 4) ..... 3
3. Abdominal tergites pale with brown area medially; antecostal ridge of tergites and sternites dark; abdominal sternites III–VI with rows of microtrichia present completely across median area ..... *S. dorsalis*
- Abdominal tergites pale without a dark median area (Fig. 5); antecostal ridge pale on tergites and sternites; abdominal sternites with rows of microtrichia restricted to lateral areas ..... *S. mangiferae*

### ***Drepanothrips reuteri* Uzel**

(Figs 1–3, 4)

*Drepanothrips reuteri* Uzel, 1895: 213.

The only species in the genus *Drepanothrips* has been recorded from Europe, Japan and North America. It is known as a pest of grapevine leaves in Europe and America, although not in Japan (Masumoto & Okajima 2007). In Britain it lives on the leaves of *Corylus* and *Quercus* trees (Mound *et al.* 1976), and Palmer (1986) recorded particularly large populations high in the canopy of *Quercus* trees despite this thrips being taken rarely on lower branches. The species is unique among the *Scirtothrips* genus-group in having the three terminal antennal segments fused to produce a six-segmented condition (Fig. 3), but the male bears a pair of conspicuous drepanae laterally on the ninth tergite (Fig. 2) similar to those found on males of *Scirtothrips*. *D. reuteri* is recorded from Iran as a pest of grape vine in Qazvin (Qazvin province) (Esmaili 1983), and subsequently it was recorded on this plant from Bojnourd region (Alavi & Kamil 1995, 2003), and Isfahan (Etebari & Hesami 2002). The species is also recorded from north of Iran, but without any host data (Cheraghian & Barimani Varandi 2000). The available data indicate that *D. reuteri* is not distributed in southern Iran, despite the expansion of grape cultivation in some parts of this area.

### ***Scirtothrips dorsalis* Hood**

(Fig. 4)

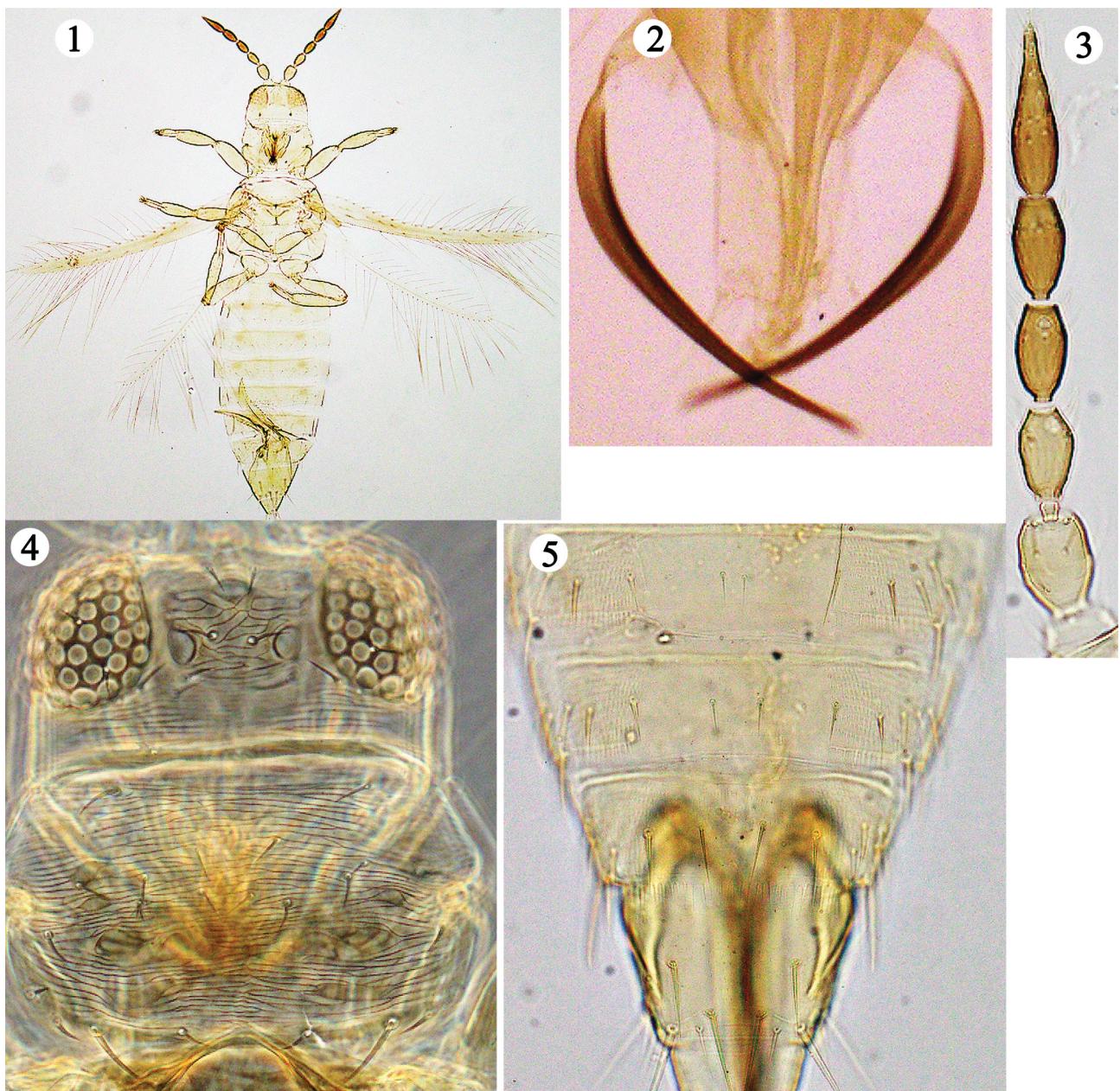
*Scirtothrips dorsalis* Hood, 1919: 90.

This is a widespread and a frequent pest in countries including the Indian sub-continent, Malaysia, Japan and Australia, as well as being an introduced pest in Israel and Florida. It has been recorded damaging crops as varied as chillies, tea, grapes, and strawberries (Mound & Palmer 1981). There is evidence of molecular diversity within species (Hoddle *et al.* 2008, Toda *et al.* 2014), and Dickey *et al.* (2015) similarly distinguished nine cryptic species within the *S. dorsalis* complex. The species was recorded for the first time from Iran when a large population was collected in spring and summer of 2015 in citrus orchards of Jahrom, Fars province, southern Iran (Minaei *et al.* 2016). This species causes distortion of leaves and fruits by puncturing epidermal cells (Minaei *et al.* 2016, Minaei 2017). Recent collections in southern Iran suggest that the species is widely distributed on various plants in this area (Minaei unpublished data, Jalil Alavi, personal communication, 2016).

### ***Scirtothrips hafezi* sp. n.**

(Figs 6–14)

**Female macroptera.** Body pale yellow, abdominal tergites III–VIII with dark antecostal ridge extending fully across these tergites; sternites with antecostal ridge not shaded; major setae on IX–X light brown; fore wings uniformly faintly shaded; compound eyes with four ventrolateral pigmented ommatidia; antennal segment I pale, II brown, III–VIII progressively yellow to light brown (Figs 6, 11).

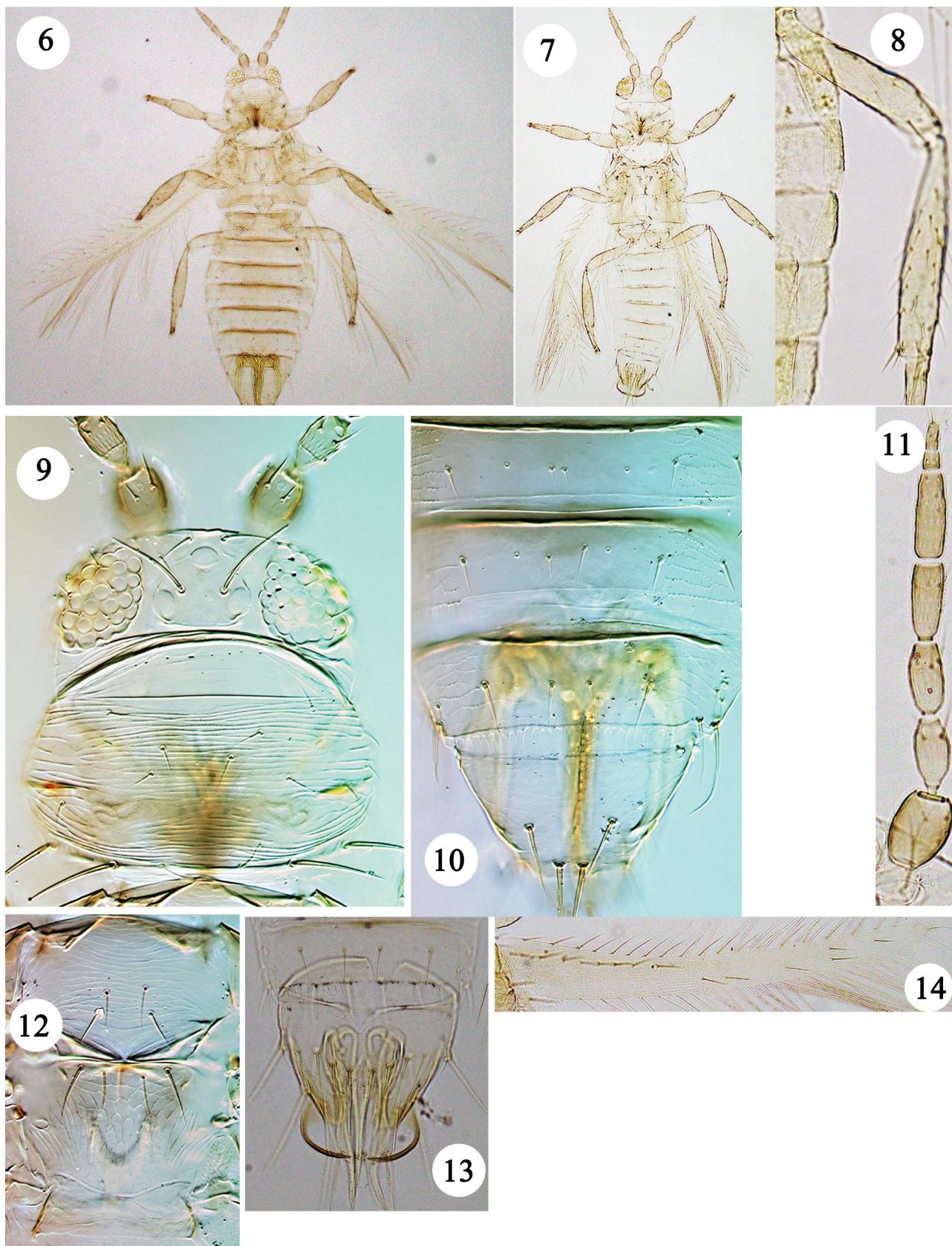


**FIGURES 1–5.** *Drepanothrips reuteri* (1) Female; (2) Drepanae (male); (3) Antenna. *Scirtothrips dorsalis* (4) Head and pronotum. *S. mangiferae* (5) Abdominal tergites VI–IX.

Antennal segments III–IV with forked sense cone short and stout. Anterior area of head including ocellar triangle without sculpture lines, a few transverse striae near posterior margin (Fig. 9); ocellar setae pair III arise on or just behind the tangent to anterior margins of posterior ocelli, setal bases closer together than length of the setae (Fig. 9). Pronotum striate, with two pairs of long setae (S2 and S3) on posterior margin (Fig. 9); posteromarginal setae S1 less than 0.2 times as long as pronotum. Metanotum reticulate medially (Fig. 12), median setae close to anterior margin and shorter and weaker than lateral pair. Fore wing second vein with 2 setae (Fig. 14), clavus with 3–4 marginal setae, and one discal seta; fore wing posterior margin with all cilia wavy. Tergites II–VI with median setae minute, usually closer together than their length; V–VI with 3 setae on lateral microtrichial field; VIII with no discal microtrichia anteromedially (Fig. 10), posteromarginal comb complete; IX with no microtrichia medially (Fig. 10). Sterna with microtrichia present laterally in three or four oblique rows, rarely extending mesad to marginal setae S2.

**Measurements of holotype female in microns:** Body length 937. Head width across eyes 145; ocellar seta III 36. Pronotum, median length 88; maximum width 167; posteromarginal setae S1 16, S2 46, S3 42. Metanotal

median setae 22, lateral setae 32. Fore wing, length 645. Tergite V median setae 12. Tergite VII median setae 18. Antennal segments III–VIII length 34, 30, 35, 40, 9, 11.



**FIGURES 6–14.** *Scirtothrips hafezi* sp. n. (6) Female; (7) Male; (8) Hind femora and tibia (male); (9) Head and pronotum; (10) Abdominal tergites VII–X; (11) Antenna; (12) Meso and metanotum; (13) Abdominal tergites VIII–X (male); (14) Fore wing.

**Male macroptera.** Smaller and paler than female (Fig. 7), tergal antecostal ridges scarcely shaded; tergum IX with pair of shaded, upwardly curved, drepanae (Fig. 13). Hind femora without stout dark setae (Fig. 8).

**Measurements of male in microns:** Body length 833. Head width across eyes 143; ocellar seta III 34. Pronotum, length 81; maximum width 147; posteromarginal setae S1 14, S2 42, S3 40. Metanotum submedian setae 19. Fore wing, length 526. Tergum V median setae 11. Tergum VII median setae 17. Antennal segments III–VIII length 29, 29, 33, 38, 8, 10.

**Material studied.** Holotype female, IRAN, Fars province, Sarvestan, *Tamarix* sp., 29.iv.2016 (KM 1435). Paratypes: 10 females, 2 males collected with holotype. 9 females, 2 males, same place and plant, 9.v.2016 (KM 1457, 1459).

**Comments.** Among the 100 species of *Scirtothrips*, only *spinosus* Faure from South Africa shares with this new species the presence of two pairs of such long setae on the posterior margin of the pronotum. These setae, S2 and S3, are both almost 50% as long as the median length of the pronotum. Similarly, within this genus the only species that shares the presence of such a long pair of interocellar setae is *inermis* Priesner that was described from the Canary Islands but has been widely reported (Mound & Wells 2015). The new species is presumably unrelated to *inermis* because of the presence, rather than absence, of drepanae on tergite IX of males. Moreover, ocellar setae pair III arise between the posterior ocelli in *inermis*, whereas in *hafizi* and *spinosus* they arise on the tangent between the anterior margins of these ocelli. However, although in *spinosus* ocellar setae pair III are shorter than the distance between the posterior ocelli (Fig. 21 in Mound & Stiller 2011), this species and *hafizi* are probably closely related. They have a similarly reticulate metanotum, but in females *hafizi* has remarkably few microtrichia on the sternites, and these are arranged in a few widely spaced oblique rows. Moreover, all of the fore wing posteromarginal cilia are wavy, and there are less than four pairs of discal setae on the tergal microtrichial areas. Judging from the original illustration by Faure (1929), the drepanae of male *spinosus* are probably less strongly curved than in *hafizi*. The presence of pigmented ommatidia on the compound eyes of *hafizi* is interesting, because *inermis* has no such pigmented ommatidia, although the condition in *spinosus* is not known.

**Etymology.** Khaje Shams-ud-Diin Muḥammad Ḥafeẓ-e Shirazi, known by his pen name Hafez (1325/26–1389/90) was a Persian poet whose collected works are regarded as a pinnacle of Persian literature. His mausoleum is located in the city of Shiraz, capital of Fars province, southern Iran. Hafez Tomb is regarded as one of most famous attractions in Shiraz.

### ***Scirtothrips mangiferae* Priesner (Fig. 5)**

*Scirtothrips mangiferae* Priesner, 1932: 143.

Described from Africa (Priesner 1932) and recorded from the eastern Mediterranean area and Gabon (zur Strassen 2003), specimens of this species have also been seen from Morocco and southern India (in ANIC). In Iran the species was recorded from siris (*Albizia lebbek*) and citrus from Ahwaz (southern Iran) for the first time (Mohiseni *et al.* 1998), and subsequently from various plant species around Iran (Minaei *et al.* 2002; Etebari & Hesami 2002; Bagheri *et al.* 2005). There is no any evidence that this species is a pest in Iran (Minaei *et al.* 2016), and the statement by Mound and Stiller (2011) that *S. mangiferae* “seems to be particularly associated with the young leaves of mango” is not supported by more recent evidence of polyphagy.

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